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09/731,194	12/06/2000	Harpreet Singh Sawhney	SAR 13800	8583

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EXAMINER

VO, TUNG T

ART UNIT	PAPER NUMBER
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2613

DATE MAILED: 07/26/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/731,194

Applicant(s)

SAWHNEY ET AL.

Examiner

Tung T. Vo

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 and 36-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-9, 12, 15, 16, 18-21, 26, 31 and 36-39 is/are rejected.
- 7) ☒ Claim(s) 10, 11, 13, 14, 17, 22-25 and 27-30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1, 5, 15, and 20 have been considered but are moot in view of the new ground(s) of rejection.

Withdrawn Allowable Subject Matter

2. The indicated allowability of claims 3 and 8-9 is withdrawn in view of the newly discovered reference(s) to Kondo (US 5,703,649). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-8, 15-16, 20-21, 36-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Kondo (US 5,703,649).

Re claim 1, Kondo discloses a method for encoding a video stream to generate an encoded video bitstream, comprising the steps of:

(a) encoding, into the encoded video bitstream, a first original frame/region in the video stream using intra-frame coding (note intra-frame coding is a coding scheme without any motion,

I-frame or Intra block, macro-block or region is being encoded by an encoder) to generate an encoded first frame/region (D2, Rs, 44, R, 45, D21, 46 and D23 of fig. 5); and

(b) encoding, into the encoded video bitstream, a second original frame/region in the video stream using motion-based predictive coding (D1, 53, 51, Rt, 44, R, 45, 464, D24 of fig. 5), wherein at least some motion information used during the motion-based predictive coding (51, and 53 of fig. 5) is excluded from the encoded video bitstream (D24 of fig. 5, note the encoded bitstream does not contain any motion information, the motion vector is outputted to transmission format conversion).

Re claim 2, Kondo further discloses wherein all of the motion information used during the motion-based predictive coding is excluded from the encoded video bitstream (51 and 53 of fig. 5, note motion compensation uses all motion vectors outputted from the motion vector detection (53)); and the encoded video bitstream (D24 or D23 does not explicitly include any motion information (note the motion vector is outputted to the transmission format conversion (4 of fig. 5)).

Re claim 3, Kondo further discloses the step (b) comprises the steps of :

(1) decoding the encoded first frame/region to generate a decoded first frame/region (D21, 47 of fig. 5);

(2) encoding the second original frame/region to generate an encoded second frame/region (Rt, 44, 45, D22, D24 of fig. 5);

(3) decoding the encoded second frame/region to generate a decoded second frame/region (D22, 47 of fig. 5);

(4) perform motion computation between the decoded second frame/region and the decoded first frame/region (51, 52, D2', 49 and R' of fig. 5);

(5) applying the motion information to decoded first frame/region (D21, 47, R', D1, 53, 51, 50, 48 of fig. 5)

(6) perform inter-frame differencing (13 of fig. 5) between the synthesized second frame/region (Pt, 52 of fig. 5) and the second origin frame/region to generate residue errors (the differenced frame/region)

(7) encoding, into the encoded video bitstream, at least some of the residue errors (Rt of fig. 5).

Re claims 36 and 37, Kondo further discloses motion computation (53 of fig. 5) during which one or more motion vectors are determined for the second original frame/region; and motion compensation (51 of fig. 5) based on the one or more motion vectors determined during motion computation, wherein at least one of the motion used during the motion compensation is exclude from the encoded bitstream (D22 and D24 of fig. 5)

Re claim 5, Kondo discloses a video encoder (fig. 3) for encoding a video stream to generate an encoded video bitstream, comprising:

(a) a frame/region type selector (15 of fig. 3) configured for selecting different processing paths for encoding different frames/regions into the encoded video bitstream (Rs and Rt of fig. 3);

(b) a first processing path (Rs, 15, D2, 16, D5, 17, D7 of fig. 5) configured for encoding, into the encoded video bitstream, a first original frame/region in the video stream using intra-frame coding to generate an encoded first frame/region (col. 5, lines 55-64); and

(c) a second processing path (Rt (or Rs), 7, 12, 15, 16, D6, 17, D8 of fig. 3) configured for encoding, into the encoded video bitstream, a second original frame/region in the video stream using motion-based predictive coding (col. 5, lines 60-67), wherein the video encoder has an encoding mode in which at least some motion information used during the motion-based predictive coding (MV is used in the motion compensation) is excluded from the encoded video bitstream (the encoded bitstream D8 does not contains any motion vector or information).

Re claim 6, Kondo further discloses wherein the video encoder is a scaleable video encoder (upper and lower hierarchy) that can be operated at a plurality of different encoding modes (15 of fig. 3) wherein:

in a first encoding mode, all of the motion information is excluded from the encoded video bitstream and the encoded video bitstream does not explicitly include any motion information (15, D2 of fig. 3, note no motion vector is in the encoded stream (D7 of fig. 3); and in a second encoding mode, at least some of the motion information is encoded into the encoded video bitstream (Rt and MV of fig. 3, col. 5, lines 45-49).

Re claim 7, Kondo further discloses in the second encoding mode, a first portion of the motion information (MV and D6 of fig. 3) is encoded into the encoded video bitstream and a second portion of the motion information (D6 of fig. 3) is excluded from the encoded video bitstream; and in a third encoding mode, all of the motion information is encoded into the encoded video bitstream (the quantization result of the motion vector MV is encoded, MV of fig. 3).

Re claim 8, Kondo further discloses the second processing path is configured for:

- (1) encoding the second original frame/region to generate an encoded second frame/region (Rt, 44, 45, D22, D24 of fig. 5);
- (2) decoding the encoded second frame/region to generate a decoded second frame/region (D22, 47 of fig. 5);
- (3) perform motion computation between the decoded second frame/region and the decoded first frame/region (51, 52, D2', 49 and R' of fig. 5);
- (4) applying the motion information to decoded first frame/region (D21, 47, R', D1, 53, 51, 50, 48 of fig. 5)
- (5) perform inter-frame differencing (13 of fig. 5) between the synthesized second frame/region (Pt, 52 of fig. 5) and the second origin frame/region to generate residue errors (the differenced frame/region)
- (6) encoding, into the encoded video bitstream, at least some of the residue errors (Rt of fig. 5).

Re claim 15, Kondo further discloses a method for decoding an encoded video bitstream to generate a decoded video stream (fig. 6), comprising the steps of:

- (a) decoding, from the encoded video bitstream, an encoded first frame/region using intra-frame decoding to generate a decoded first frame/region (D23', 22, D21', 23 of fig. 6); and
- (b) decoding, from the encoded video bitstream, an encoded second frame/region using motion-based predictive decoding (D24', 22, D22', 23, D2', and 27 of fig. 6), wherein at least some motion information used during the motion-based predictive decoding is generated by performing motion computation as part of the decoding method (MV', 25, Pt' of fig. 6, note the motion detection detects the motion vector that is used for decoding method).

Re claim 16, Kondo further discloses wherein the encoded video bitstream (D23' and D24' of fig. 6) does not explicitly include any motion information and all of the motion information used during the motion-based predictive decoding is generated as part of the method (MV' is used for the decoding method in the motion based predictive (MV1 and 25 of fig. 6).

Re claims 38 and 39, Kondo further discloses wherein the motion based prediction decoding further comprises motion computation for the encoded second frame/region based on one or more motion vectors (MV' and 25 of fig. 6), wherein at least one of the motion vectors used during the motion compensation is determined during the motion computation (53 of fig. 5)

Re claim 20, Kondo discloses a video decoder for decoding an encoded video bitstream to generate a decoded video stream, comprising:

(a) a frame/region type selector (24 of fig. 4) configured for selecting different processing paths for decoding different encoded frames/regions from the encoded video bitstream;

(b) a first processing path (D7', 22, D5', and D2' of fig. 4) configured for decoding, from the encoded video bitstream, an encoded first frame/region in the video stream using intra-frame decoding to generate a decoded first frame/region; and

(c) a second processing path (D8', 22, 23, Rt', D2, Ps' of fig. 4) configured for decoding, from the encoded video bitstream, an encoded second frame/region in the video stream using motion-based predictive decoding, wherein the video decoder has a decoding mode (15 of fig. 4, note selector (15) selects the MV' for motion compensation (15 of fig. 4) for decoding process) in which at least some motion information used during the motion-based predictive decoding is generated by the video decoder performing motion computation.

Re claim 21, Kondo further discloses wherein the video decoder is a scaleable video decoder that can be operated at a plurality of different decoding modes (15 of fig. 4), wherein:

in a first decoding mode, the encoded video bitstream does not explicitly include any motion information (D2 of fig. 2) and all of the motion information is generated by performing the motion computation by the video decoder (wherein the motion information is computed by the motion detection (7 of fig. 4) that motion vector is used for decoding process (MV', 25 of fig. 4); in a second decoding mode, at least some of the motion information is decoded from the encoded video bitstream (Rt' and MV of fig. 4, the Rt' and MV are decoded).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4, 12, 18 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo (US 5,703,649) as applied to claims 1 and 5, and further in view of Suzuki et al. (US 6,097,842)

Re claims 4, 12, 18 and 26, Kondo teaches the limitations above except encoding or decoding a third original frame/region in the video stream using tweening based on the motion information used to encode the second original frame/region as claimed.

However, Suzuki teaches a third processing path configured for encoding/decoding, into the encoded video bitstream, a third original frame/region in the video stream tweening (the

applicant discloses video stream tweening is an interpolating process) based on the motion used to encode the second original frame/region (24 of fig. 15, e.g. the lower decoded frame/region is enlarged (interpolated) by the resolution conversion 24 and the enlarged or interpolated frame/region to the encoder 23 of fig. 23, see also decoding 94 of fig. 29).

Therefore, taking the combined teachings of Kondo and Suzuki as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the third processing path of encoding/decoding of Suzuki (24 of fig. 15 for encoding , 94 of fig. 29 for decoding) of Suzuki into the system of Kondo for the purpose of encoding the video steam tweening based on the motion. Doing so would allow the data volume is reduced and decoding efficiency is improved.

7. Claims 9, 19 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo (US 5,703,649) as applied to claims 5, 15, and 20, and further in view of Boyce (US 6,490,705).

Re claims 9, 19, and 31, Kondo teaches all limitations above except wherein the encoding in the first processing path and the encoding of the second original frame/region in the second processing path are based on intra-frame wavelet encoding and de-interlacing a decoded second frame/region generated during the second decoded frame/region to generate two corresponding fields corresponding to the decoded second frame/region.

However, Boyce teaches the encoding in the first processing path and the encoding of the second original frame/region in the second processing path are based on intra-frame wavelet encoding (col. 1, lines 60-61, 102, 104, and 105 of fig. 1) and de-interlacing a decoded second frame/region generated during the second decoded frame/region (506 of fig. 5) to generate two corresponding fields corresponding to the decoded second frame/region (507 and 510 of fig. 5).

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Therefore, taking the combined teachings of Kondo and Boyce as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Boyce into the system of Kondo for intra-frame wavelet coding and de-interlacing the decoded frame/region. Doing so would allow the decoder to minimize the visual degraded portion of the decoded frame as suggested by Boyce (col. 14, lines 21-24).

Allowable Subject Matter

8. Claims 10-11, 13-14, 17, 22-25, 27-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

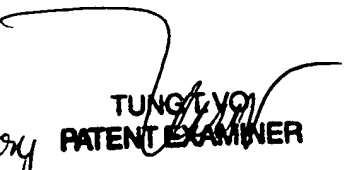
Martucci et al. (US 5,764,805) discloses a low bit rate video encode using overlapping block motion compensation and zero-tree wavelet coding.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung T. Vo whose telephone number is (703) 308-5874. The examiner can normally be reached on 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris. Kelley can be reached on (703) 305-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

primary

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